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Modelling Terrorist Behavior: Developing Investigative Decision Making Through the Analysis of Empirical Databases

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MODELLING TERRORIST BEHAVIOR: DEVELOPING INVESTIGATIVE DECISION MAKING THROUGH THE ANALYSIS OF EMPIRICAL DATABASES

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MODELLING TERRORIST BEHAVIOR: DEVELOPING INVESTIGATIVE DECISION MAKING THROUGH THE ANALYSIS OF EMPIRICAL DATABASES

1 - Report Overview

It is intended that this report will both outline further developments in the behavioural modelling and elucidate developments in the theoretical underpinning of the project. In addition to the continued analysis of actions observed during terrorist hostage taking the theoretical psychological rationale of the models produced has been greatly advanced. As the models of behaviour are developed it is seen as particularly important to drive their evolution with sound psychological theory.

Taking a multidimensional approach to the modelling of behaviour it is essential to have a rational basis for the explanation of the complex interrelations found in the data. The Social Identity Approach has been found to be particularly beneficial in understanding the psychological processes occurring during hostage taking as it affords an explanation of inter- and intra-group processes from individual through to societal level.

The current report will detail a number of specific conceptual models derived from the more general behavioural models outlined in previous reports. Their use in the construction of a broader understanding of the processes and mechanisms of hostage taking events will be explained. The requirement of structuring the conceptual models within a sound psychological meta-framework will be outlined.

The current research is thus aimed at developing multidimensional models of hostage taking interactions in order to predict outcome from patterns of interrelated behaviours observable during an incident. An understanding of the relationship between the patterns of behaviour and the eventual outcomes resulting should have significant operational value to negotiators and investigators during an event. The alliance of psychological theory to the behavioural modelling will ensure that any predictions which may be made are as accurate as is possible given the wide variations not only in behavioural strategies but also in environmental, political, historical and socio-cultural contexts effecting terrorist activity.

2 - A Need for Theory: A Social Psychology of Hostage Taking

The research aims to analyse the patterns and interactions in behaviour occurring in hostage taking using Multi-Dimensional Scaling techniques. Although the present work is primarily concerned with behaviour, it is important that this be seen in its environmental and social context. Over the last two decades social psychologists have increasingly emphasised that behaviours cannot be viewed independently. They are seen to be an integral aspect of a complex system of social and environmental interactions.

It is therefore important to understand how the environment and the social rules of a situation shape people's behaviour. Thus in hostage taking incidents it is important to consider contextual information, such as the location of the incident and the time scale over which it takes place. It must be acknowledged that these context facets will influence the behaviour of all those involved.

The complex interaction of intention, context and action has further methodological implications for the study of behaviour. Behaviours do not exist in isolation, they are interdependent, and as such their study requires a multivariate approach. The current work is therefore directed towards developing an understanding of the behaviours associated with hostage taking and their co-occurrence within the social and environmental context.

Taking a social psychological framework requires that variables should be identified which will contribute to an understanding of the goals and expectations of the people involved. It is therefore appropriate to consider hostage taking as a social interaction, which is guided by a series of roles, and associated rules. It is thus necessary to take a multidimensional approach in attempting to understand the complex nature of the transactions, both physical and symbolic, occurring during an hostage taking event.

The following section will briefly outline the fundamental aspects and assumptions of a psychological theory which has been found to be particularly useful in understanding the behaviour in hostage taking situations. The Social Identity Approach has been found to be particularly beneficial as it allows an understanding of intergroup processes identifiable at a societal level in terms of individual psychological operations. Previous work relating to the social and environmental context and considering the roles and rules of the participants can be drawn together under the social identity approach. The social identity approach can be considered to be being utilised as a meta-theoretical framework allowing the derivation of hostage taking specific theory. It complements and extends the previous theoretical constructs used in explanation of these events.

3 - Social Identity Approach: Understanding Individuals, Groups and Societies

One psychological approach which may prove to be fruitful in the comprehension of terrorist hostage taking is the Social Identity Approach (SIA) (Hogg and Abrams (1988)). This is a theoretical approach allowing an understanding of intergroup behaviour from the level of individual processes through to societal contexts.

A central tenet of the social identity approach is that membership of a group is largely a *psychological* state which is distinct from that of being a unique individual. It confers a *group identity*, i.e. a shared/collective representation of who one is and how one should behave. Group behaviour is hypothesised to be qualitatively different from individual behaviour. The group, and its personal meaning, is contained in the mind of an individual and effects behaviour correspondingly.

A social group is defined as being two or more individuals sharing common social identification of themselves or perceive themselves as being members of the same category (Hogg & Abrams, 1988). One's self-identity is seen as largely defined through self-descriptions or conceptions derived from the characteristics of the social groups to which one belongs. Identification with a group is a psychological state and is more than simply categorisation as being in one category or another. It is more wide ranging in implication than cognitive appraisal alone, being experienced as real and playing a role in self-evaluation.

The social identity approach considers the group to be based in the individual, the reverse of the traditional social psychological approach. It considers identity and self-definition to mediate between social categories and individual behaviour. It further considers the psychological processes involved in translating social categories into human groups.

3.1 - Social Identity and Social Structure

The dialectic between individuals and society is proposed to be mediated by the social identity. Societies are comprised of large scale groups such as ethnicity, sex, occupation, class etc, which vary in power and status to one another. The dominant group(s) control the material power to spread its own view of the nature of society; the groups comprising it and the interrelations between them. It imposes the dominant value system and ideology which is such that it benefits the most and promotes its own legitimacy and the status quo.

Individuals are born into this structure and by virtue of their relative place in the system fall into some categories rather than others (sex, race, class, physical ability, mental ability, etc). They develop particular social identities through internalisation of their perceptions of their own category membership and this will result in relatively positive or negative self-perceptions.

Subordinate groups (those with low relative power and status) will have relatively negative evaluations of social identity and thus lower self-esteem than those in superordinate groups. This has unsatisfactory implications for self-concept and thus people are motivated to try to alleviate their situation. There are various strategies available depending upon the individuals subjective belief structures of the nature of society: *social mobility* and *social change*.

Social mobility refers to the belief that groups have permeable boundaries. An individual can move into new group, redefining his or her 'self' in terms of the new group identity, disassociating from the previous group. This leaves the balance of social groups unchanged and thus inhibits collective action such as riots and demonstrations. This belief relates to individual freedom, seeing it as relatively simple to redefine ones social identity in order to improve ones situation.

Social change is based on the premise that groups are impermeable. A person cannot leave the group they find themselves in unless the status quo can be altered: One cannot leave a subordinate group to join a dominant one, the social order itself must be changed to improve the groups status. There are two substrategies of social change, *social creativity* and *social competition*.

Social Creativity does not alter the status quo yet enables the subordinate group to consider themselves more positively. There are three further types of social creativity: 1) using different dimensions of intergroup comparison such that they can consider themselves in a more positive manner, 2) evaluative redefinition of traditionally negative characteristics and 3) using different comparison group such that comparisons are more favourable.

Social competition only occurs when the subordinate group can see no other options. If a viable alternative social order can be conceived then the legitimacy of the status quo can be called into question. A radical alternative ideology is developed projecting the subordinate group into direct contention with the dominant group. This may then be operationalised through constitutional politicization of contention or may result in violence.

Social competition is the mechanism proposed to underlie the majority of terrorist activity and thus is important in the consideration of behaviour in terrorist hostage taking. The nature of a group will be determined to an extent from the social, historical and political contexts within which it develops. It will be further influenced by the perceptions of the individual members and the operation of the in-group socialisation processes and the resultant group rules and norms which develop.

3.2 - Social Identity Approach and Intergroup Behaviour

When a group forms it is proposed to delineate itself against an outgroup, this categorical distinction then takes on a value-laden content. Stereotypes are applied to outgroups depending upon the actual and perceived relations between the groups. Cultural, physical and personality differences are not necessary for the emergence of intergroup conflict. The existence of competition for a goal which only one group can achieve is sufficient for intergroup hostility to arise.

From studies it has been shown that the social categorisation of individuals into discontinuous groups is enough to stimulate intergroup competition. The accentuation of differences is biased in favour of the ingroup because individuals are deriving social identity from their perceptions of the social category in which they find/place themselves. It is the involvement of self-definition which results in the need to maximise positive self-evaluation and this can be achieved by favourable ingroup comparisons.

Doise (in Hogg & Abrams, 1988) has suggested that in cognitively differentiating two objects by categorizing them on one dimension (eg behavioural) a person also tends to distinguish them on other dimensions too (evaluative and representative). Work has shown that anything which increases the salience of a social categorisation leads to greater intergroup differentiation. Division on one dimension being mirrored by division on others too.

Individuals have a vested interest in being associated with categories which are positive as these allow positive self-identity to be constructed, resulting in positive self-esteem. The social identity approach argues that it is the striving for self-esteem which leads to ethnocentrism at an intergroup level, and for variation in its extremity. Social categorisation and social comparison creates an accentuation of intragroup similarities and intergroup differences amongst members and thus exaggerates intergroup differences.

In the current work terrorist groups are hypothesised to vary in the degree of cooperation and hostility they show to outgroups, depending upon their nature. Groups based upon very clear and fundamental categorical dimensions will have stronger in- and out-group perceptions and thus may be expected to be less flexible in dealing with representatives of outgroups. In contrast, terrorist groups whose aims are less in direct opposition to those of the dominant group can afford to be more flexible in their interactions with outgroups.

4 - Development of Conceptual Models in Hostage Taking Events

The behavioural models developed during the first year of the research indicate that hostage taking incidents can be characterised by groups of behaviours which reflect different types of operation. Thus terrorist hostage taking incidents have been successfully identified and classified by the observed actions carried out during an event.

Analysis within a temporal framework has identified a range of behavioural strategies available to hostage takers at different stages of a hostage taking event. The results suggest that it may be possible to predict further developments and likely outcomes of a hostage taking event from observable features of hostage takers behaviour.

The current research is directed towards further examination of these two areas and their interaction. In order to develop principles for negotiation and management of terrorist hostage taking, it is necessary to identify the relationship between the hostage taker's behaviour and the eventual outcome of the event in which it was evidenced. Thus for example, initial violence exhibited by well prepared and sophisticated groups may be predictive of different outcomes than the same type of violence exhibited by spontaneous and more personally motivated incidents.

To this end a number of conceptual elements have been derived from consideration of both content analysis of the cases and literature review. Items considered to be measuring aspects of these dimensions have been included in a number of Multiple Scalogram Analyses (MSAs) in order to ascertain their role. Understanding the part played by specific actions within the context of their occurrence would provide a much more detailed basis for decision support in the management of hostage taking incidents.

A fundamental assumption underlying the current work is that behaviour exhibited by terrorists will indicate enduring aspects of their mode(s) of operation. It is held that behaviour will be the result of underlying stable psychological dimensions. Thus, actions carried out at any given time will result from the interaction of the situational demands and stable psychological characteristics of the terrorists involved. If actions are considered to result from people's understanding of their world then logically their actions, which can be observed, can be used as indicators of their understanding of the world they are transacting with.

The analysis of hostage taking behaviour using Smallest Space Analysis allowed the development of models which illustrate the range and the nature of variation in differing hostage taking strategies. From these analyses hypothetical constructs proposed to underlie hostage taking behaviour were considered. A variety of constructs thus hypothesised to play a role in influencing activity during hostage taking were identified.

Such models will be of benefit both theoretically, in the comprehension of factors underlying the predicted patterns of behaviour, and practically, in isolating key dimensions in event determination and thus prediction of likely responses to interventions and ultimate outcomes.

Having identified concepts which prove to have function in explaining possible variation in terrorist hostage taking a wider scale model can be reconstructed by considering their interaction. A general model created from the combination of these specific submodels will

benefit over the previous SSA models derived as it will be composed solely of the items found to be indicative of important aspects of such events.

The following section outlines the findings of research into five postulated constructs considered to play a part in determining events during hostage taking. The models being described were derived from consideration of one hundred events of aerial hijack, ranging in occurrence from 1968 through to 1994:

- 1) Hostage Control Strategies
 - techniques and modes of control exhibited by the terrorists
- 2) Firearm use
 - typical strategies of use of firearms
- 3) Terrorist/Hostage Interaction
 - patterns of interaction between the hostages and their captors
- 4) Hostage Release
 - strategies of hostage release
- 5) Resources Available
 - typical resources obtained by terrorists to carry out a hostage taking

4.1 - Modelling Hostage Control

The first construct to be examined is that of hostage control. One of the first things that the terrorists must do, before issuing demands and entering negotiations, is to establish control over their hostages. Further, control must be maintained for the entire duration of the event. Thus, the nature of the control exercised is likely to be a powerful indicator of the terrorists' behavioural approach towards their hostages.

The terrorists typically require that the hostages remain relatively uninvolved. Hostage activity will distract the terrorists from their goal of gaining concessions from the third parties involved. The purpose of taking hostages is to provide human currency in the negotiation phase of an event. Taking a social psychological perspective, it is hypothesised that the terrorists and their hostages would rapidly fall into socially and consensually accepted roles. The roles of terrorist and hostage are widely known through accounts in the media, giving both parties a sound basis on which to found their activity.

Hostage controlling behaviour is proposed to be necessitated in either of two ways. Firstly, a terrorist or group of terrorists may interpret their role as requiring more or less active control of the hostages. It may be a characteristic of one terrorist group to maintain tight control of their hostages at all times, whereas another may consider such control to be more ancillary to the event for them.

The second consideration is that of the hostage behaviour. The hostages have some scope for action. They can elect to remain passive or they may attempt to resist the terrorists. If hostages try to foil the terrorists then the terrorists are put into a situation where they have to exert power over the hostages in order to (re)establish control of the event.

Control can thus be hypothesised to be a function of both the terrorists themselves and situational demands. A number of potential methods of control were included in the analysis. These were 1) addressing the hostages politely, 2) threatening the hostages (verbally), 3) tying the hostages and 4) firing weapons to gain control.

It was found that in the majority of cases (74%) no overt method for controlling hostages was displayed. It may be speculated from this that the presence of the hijackers is enough to invoke "hostage behaviour" in the passengers. As stated above, from a social psychological perspective it may be considered that the passengers take a "hostage role". Their subsequent actions will be based upon their perceptions of how participants of hijacks are expected to behave and the actions of the terrorists towards them. The behaviour of the terrorists towards the hostages will be a strong indicator as to what is expected of them.

In the remaining 26% of events some form of active control technique is used by the hijackers to impose their presence on their hostages. As stated above, there were four controlling actions identified in the database. Firing guns appears to be the most common method of establishing control. This occurred in 14% of the hijacks in the database. Acting politely and informing hostages that no harm would come to them if they cooperated occurred in 3% of the events. Threatening the hostages with harm if they did not cooperate occurred in 2% of the cases. In the remaining cases combinations of these control methods were used. Tying the hostages was never used as a control strategy on its own, occurring in combination with

polite address in one event (1%) and in combination with firing guns in two events (2%). The terrorists fired weapons and treated the hostages politely in one case (1%) and fired weapons and threatened the hostages in two cases (2%). In only one event (1%) was more than two control techniques used, hostages being tied after both threatening and firing weapons.

Figure one indicates a conceptualised structure to hostage control, distinguishing between verbal and physical control and within physical control between intimidatory and direct physical intervention. These modes suggest a scale ranging from the application of no control, through verbal to the use of physical violence. However, further research is necessary to establish the empirical validity of such a relationship amongst the control strategies.

Using the model as a foundation it may be possible to identify typical outcomes arising from the various control types. If any or all of the control strategies are consistently associated with particular outcomes or specific features of an event it will be possible not only to test the hypotheses as to the nature of the terrorists but also to use the model as a basis for outcome prediction.

It is not currently possible to make predictions of later events from the control model alone due to the small number of cases that it actually includes. Only 26% of the cases were included in the control model itself. This is due largely to the lack of information available. More detail would allow this model to be expanded upon and tested in terms of predictive validity.

Verbal	Physical	
	Intimidation	Direct
Polite Address	Fire Weapons	Tie Hostages
Make Threats	No Shots Fired	None Tied
Neither		
	2 Possible Intim. Modes	2 Possible Direct Modes
3 Possible Verbal Modes	4 Possible Physical Modes	
12 Possible Hostage Control Modes		

Figure 1: Table Indicating Type of Control Style

4.2 - Use of Guns During Aerial Hijack

Another area of interest is that concerning the use of force by hijackers during the course of an event. This is particularly reflected in the use of firearms. While explosive devices are often available to hijackers they are commonly used solely for threat purposes. The use of explosives by hijackers is a last measure due to the nature and extent of the damage typically caused. Other weapons such as knives may be used but the frequency of this is relatively low. It is for these reasons that the use of firearms in hijack is focused on in the current analysis.

A conceptual scale of firearm use was developed from previous analysis on the hijack database. The scale ranged from no firearms being available to the spontaneous and unprovoked use of such weapons. Figure 2 illustrates the results of the current analysis.

It can be seen from this that hijackers did not have guns in almost thirty percent of the events. However, of the remainder who did, not all of them actually used them. In thirty nine percent of cases hijackers did not use weapons which they brought, meaning that in the remaining thirty one percent of hijack events guns were fired. In twelve percent of the cases firing was due to provocation from other parties, either hostages or hostage rescue teams. In sixteen percent of cases shots were fired spontaneously. Weapons were fired spontaneously and in response to others actions in only three percent of cases.

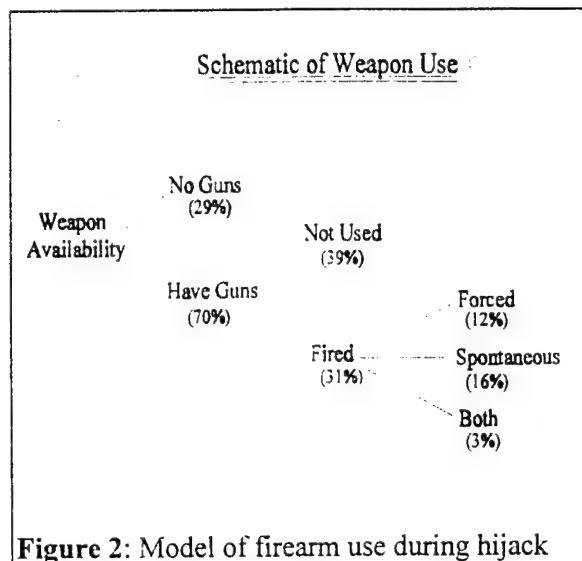


Figure 2: Model of firearm use during hijack

The storming of aircraft was also considered in the analysis. Storming refers to the forceful closure of an event through armed intervention by the authorities concerned. It was included in order to ascertain the relationship between hijacker weapon use and the display of force on the part of the authorities. It was hypothesised that greater violence by the hijackers would be met with an increased likelihood of force by the authorities.

It can be seen from the table below that the storming of an aircraft is not decided solely on the use of firearms by hijackers. This is apparent from the fact that events have been closed through storming in cases where firearms were neither held nor used.

	Stormed	Not Stormed
Fired Weapons	10	22
Weapons Not Fired	14	54

Table 1: Cross-Tabulation of Terrorist Weapon Use and Aircraft Storming

Table 1 illustrates the percentages of cases in which weapons were either fired or not and in which the aircraft was stormed or not. At first it would appear that aircraft were more often

stormed when weapons were not fired by the hijackers. This is contrary to the hypothesis being tested, that force is met with force. However, if the ratio of stormed to non-stormed events is compared when the hijackers fired weapons and when they did not the expected relationship is found. When hijackers do use their weapons they are 1.7 times more likely to be stormed than when they do not. While this result is not statistically significant it does imply that a show of force by the hijackers increases the potential of a violent end to an event.

4.3 - A Model of Hijacker Interaction with the Hostages

From a psychological perspective verbalisations can be considered to be actions. It may thus be possible to determine something of the nature of the hijackers from their mode of interaction with their hostages. It may be hypothesised that the nature of the interactions would indicate the typical nature of the hijackers, as they are in direct contact with the hostages.

Figure 3 shows the resultant MSA plot from the analysis. It was clear from the analysis that in the majority of events (73%, represented by point 3) no overt details of interactional style were available. There are two possible reasons for this. Firstly, some groups may keep interaction with the hostages to a minimum. There may be a number of rationales for this, such as to dehumanise the hostages or simply because they are not considered as of import to the hijackers beyond their blackmail value. The second potential reason is the lack of information available in the database. The information has been drawn from publically

available sources, typically press releases. Unfortunately the dialogue in the aircraft is not generally considered after other aspects such as hostage injury, negotiation, demands made and terrorist identification has been discussed.

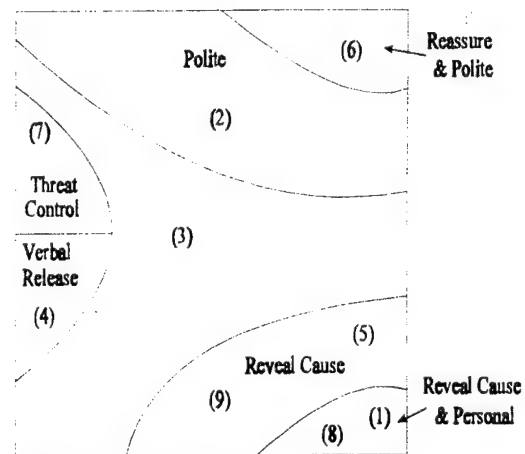


Figure 3: MSA of Terrorist-Hostage Interaction

There is an interesting pattern in the dialogue types evident in the database however. It can be seen in Figure 3 that there are three regions of items around the core discussed above. The first region relates to the terrorists addressing the hostages in a considerate manner. This is the region in the top right-hand corner of the plot. There are two items in this region, "passengers being reassured" and "polite address of the hostages". Reassurance of the passengers can be seen to fall inside the region covered by polite address, indicating that if the former occurs the latter must also.

A similar relationship is found between the items in the second region, those relating to explanatory interactions. This region shows a similar pattern to that of the considerate address region discussed above. In this region the interactions relate to the hostage takers "revealing personal details" and "revealing details of the cause" they are carrying out the event for. However, in all events in which personal details are revealed it was found that the nature of the cause was also revealed.

The third and final region relates to controlling behaviours. These being "threat control" and "verbal restraint". However, unlike the previous two regions these interaction modes are

mutually exclusive. This means that if the hijackers use one form of control they do not use the other form.

Figure 4 below illustrates a schematic diagram of the modes of interaction evident. As outlined above, there are three modes identified; 1) the Consideration Mode, 2) the Control Mode, 3) the Explanatory Mode. No interaction was found between these different types of dialogue. That is, if one type of dialogue was apparent the other types were not.

The considerate mode of dialogue covers polite interaction with the hostages and reassurance that they will not be hurt. Reassurance of the hostages only occurs if the terrorists talk to their hostages politely. However, the hijackers may address their hostages politely without actually making reassuring statements.

The explanatory mode relates to interactions in which the hijackers explain the broad motives for the event. These may be outlining a cause for which the hijackers are acting or may be personal disclosures. As with dialogues indicating consideration for the hostages, remarks revealing personal details are only made if more general comments of causes for the hijack are also made. However, the hijack may be attributed to a given cause without personal details having necessarily been disclosed.

The final type of interactions, those of the control mode of interaction covers statements ordering the hostages to behave. There are two independent subtypes of control dialogue. The 'mildest' is verbal restraint. This refers to the hijackers ordering their hostages not to move. They do not make any additional statements relating to likely outcomes if the hostages do not do what they are told. Threat control, however, details interactions in which overt threats of reprisal are issued should the hostages not obey their instructions.

These three modes of dialogue may be associated with different types of hijacker. It is hypothesised that hijackers showing a *considerate* mode of discourse with the hostages are confident in their convictions and rational. They may take the view that the hostages are unfortunate to be involved and harbour them with no ill intent. They treat the hostages well as they have no argument with them.

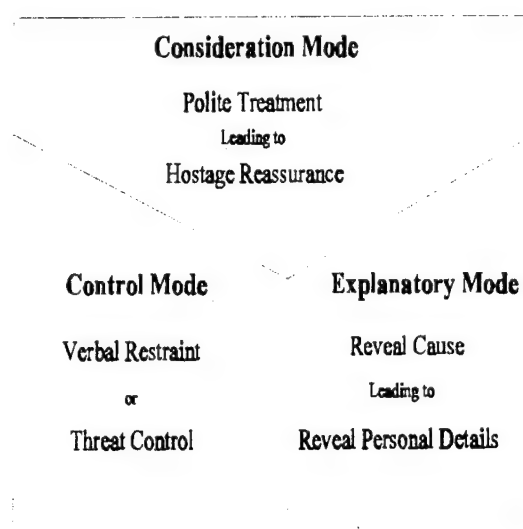


Figure 4: Schematic Model of Hostage-Hijacker Interaction

Hijackers taking a *controlling* mode of interaction with the hostages may be hypothesised to be less certain of themselves, as evidenced by forcing their presence on the hostages. They do not view their presence as being enough to ensure the hostages behave as they wish without making further comments or threats. If this type of interaction is evidence of insecurity it may be found to be associated with inexperienced or irrational hijackers.

The explanatory mode of interaction may be characteristic of hijackers who feel that they need to rationalise themselves to their hostages. They too may be insecure and irrational but rather than trying to inflict themselves on their hostages in a gesture of power they are trying to establish contact with their hostages by getting them to identify with their reasoning for the event.

4.4 - Modelling the Release of Hostages During Aerial Hijack

Identification of typical methods or strategies of hostage release may be particularly useful in identifying the nature of the terrorist threat during the course of an aerial hijack. It is hypothesised to be of value as it is a clearly observable action. It is proposed that associated behavioural characteristics will be predictable from a knowledge of release strategy. In order to test these hypotheses Multiple Scalogram Analysis (MSA) was used to model the release patterns observed in the one hundred cases of aerial hijack contained in the database.

It was evident from the analysis that there were three modes of release indicated. Terrorists could: 1) Not release any of their hostages during the course of the event.

2) Release hostages immediately upon arrival at the destination from which negotiations were commenced, or

3) Not release any hostages immediately but to allow hostages to be released throughout the subsequent course of the event.

The different modes are represented in Figure 5 on the right. It is of interest to note that immediate release and later release are mutually exclusive categories. This means that during the one hundred events included in the analysis if the hijackers released any hostages immediately they did not also release any more on subsequent events. Likewise, if hostages were released during the course of an event none would have been allowed to go free at the outset of the event.

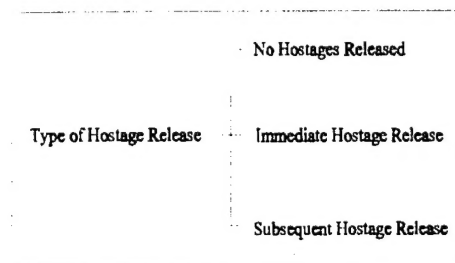


Figure 5: Hostage Release Mode

Within each of the hostage release modes there are further specific strategies. Figure 6 below illustrates these. It is conceptualised that within each release mode it is possible to release either all or some of the hostages. If sub-groups of hostages are released there are further categories identifying the different strategies. In 'immediate release' groups of hostages may be released according to either their vulnerability or their nationality. 'Vulnerable' refers to women, children, old and ill people. In later release groups hostages are released on either compassionate grounds or through negotiation. 'Compassionate' release refers to spontaneous release of 'vulnerable' hostages during the course of negotiation. Negotiated release refers to the release of any hostages during the course, and as a direct result, of negotiations. From the original content analysis of the hijacks it appeared that 'later release by nationality' did not occur. More details of the precise nature of negotiations are required to further test this assumption.

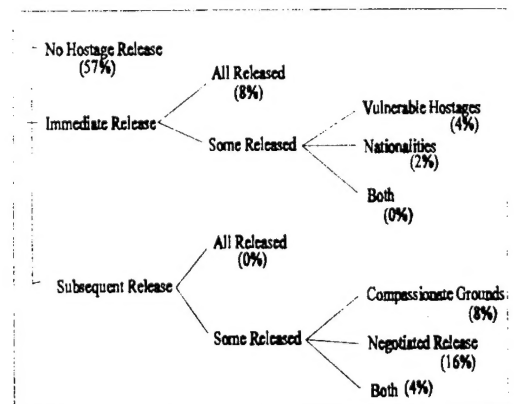


Figure 6: Expanded Hostage Release Modes

It can be seen from reference to figure 6 that not all of the possible release strategies and combinations thereof occur in actual hijacks. For instance, if some passengers are released immediately it will be on either vulnerability or nationality grounds but not both. Similarly, terrorists who release hostages later in an event will never release all hostages together but may release groups for both compassionate and negotiated reasons.

Hypotheses can be suggested as to the nature of hijackers and possible associated behavioural patterns from knowledge of the hostage release strategy observed. Not releasing any passengers may imply one of two things. Firstly that the hijackers are so determined to achieve their aims that they will not consider relinquishing control of their hostages at any cost. Secondly, it may be that the hijackers have not considered the possible value of actively using their hostages in bargaining. The immediate release of all hostages puts the hijackers into a considerably weakened state concerning negotiation. Although they can still threaten damage to the aircraft they do not have lives to bargain with.

Hijackers who release passengers immediately may be trying to indicate their credibility very early on, or they may be trying to present a certain type of image from the outset. Release of vulnerable passengers may be a way of indicating that they are reasonable people, not without compassion. It may be that they are trying to establish a particular type of dialogue with negotiators based upon the fact that they are rational people, not violent criminals. Releasing passengers of specific nationality on the other hand may be an attempt to establish political credibility. They are indicating that they are very focused in terms of their potential target. The releasing of hostages on account of nationality implies that others are being targeted because of their nationality.

The release of passengers during the course of an event may be a strategy indicative of the most 'sophisticated', or experienced, hijackers. It may be hypothesised that they realise the importance of the hostages to their mission but are willing to be flexible in their control. If passengers become ill during the course of an event (having a heart attack for instance) they may be released depending upon the circumstances. Similarly, the hostages role as 'bargaining chips' is recognised and they may be released throughout an event as part of the negotiation process.

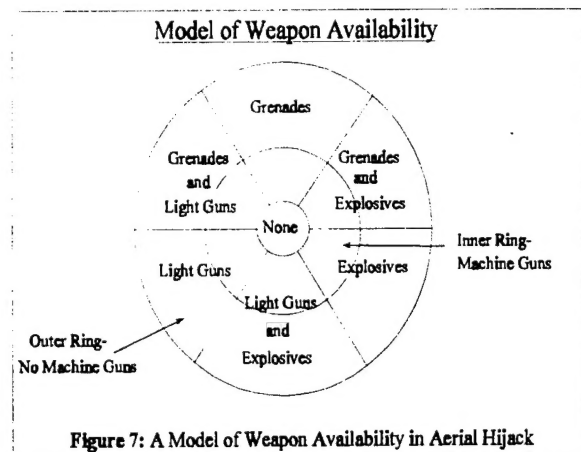
It was apparent that in immediate release of some passengers were released for a single reason. They were allowed to leave the aircraft on the basis of their vulnerability or their nationality but not both. If hijackers release passengers later in an event they may use one or both of the strategies discussed. This is evidence that later release is characteristic of more sophisticated hijackers as it indicates reaction to events as they occur rather than simply the rigid execution of preorganised actions. Further research is required in order to test this hypothesis.

4.5 - Classification of Weapon Availability During Aerial Hijack

When considering the resources available to hijackers it is apparent that weapons are the most amenable to observation. It is hard to consider information as a tangible resource as it is not directly observable. Once hijackers have made their presence on board an aircraft known their most immediate goal is the establishment of control, for which little more than weaponry is necessary. For this reason the analysis being discussed focuses solely on weapon availability.

Weapons are necessary for hijackers to establish their intent, to indicate credibility and to gain control of an aircraft through either implicit or overt threat of injury or death to the crew and passengers. It may be possible to ascertain the nature of the hijackers by knowledge of the weapons which they have available. It may be hypothesised that hijackers with no weapons, fake weapons or unlikely weapons are probably relatively inexperienced. However hijackers with access to modern firearms and explosive devices are likely to be more organised and more experienced in terrorist activity.

From Figure 7 the pattern of weapon availability in the hijacks in the database can be seen. The model represents the distribution of weapons found to be held by the hijackers during an event. The four main types of weapon can be seen to be grenades, explosives, machine guns and 'light guns'. Machine guns is the code used to indicate fully automatic weapons while light guns is used to indicate non-automatic weapons.



It can be seen that nearly every possible combination of weapons occurs. This would imply that if hijackers do have access to any modern weapons then they have access to all of them. However, the frequency of occurrence of the different types of weapon does vary. One of the few exceptions to this is that hijackers are unlikely to have only machine guns. If they do have such weapons they are likely to have at least one other type of weapon as well. However machine guns are relatively uncommon, being found in only 10% of the hijacks in the database.

5 - Summary

The report has outlined an additional theoretical perspective which is complementary to the previously outlined social psychological approach of role theory. This approach can be used as a framework from which hypotheses about the nature of terrorist-hostage-authority interaction can be derived. Having created a model of terrorist behaviour a number of constructs which play a useful role in explaining the range of variation in behaviour are being identified. The next stage after the identification of the models which provide useful information as to behavioural variation is to recombine these models to create a clear overview of the central behavioural indicators of terrorist behaviour.

Taking the models of terrorist behaviour and the theoretical perspectives in combination a number of hypotheses as to the interrelations of the terrorists and hostages and the terrorists and authorities can be made. From a knowledge of the socio-political context of an event and the mode of action of the terrorists the research aims to develop predictions as to the nature of the intergroup interactions and from that likely outcomes can be suggested.

The research on construct development is proving to be a productive path to take in understanding the complexity of the various issues and actions arising during hostage taking, however there are limitations imposed upon their application. While research tentatively appears to suggest the efficacy of this approach the numbers of cases from which information is available is relatively low. Given the nature of the data, being from publicly available accounts of hostage takings, much of the information necessary for a solid psychological understanding of more detailed terrorist-hostage and terrorist-authority interaction is unavailable. With access to more such information the predictive power of the behavioural modelling process would be greatly improved.

Future work will include the expansion of the specific conceptual models, their integration to "reconstruct" general models of hostage taking types and testing the potential for the report the prediction of both interaction patterns and event outcomes.